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ON A POSSIBLE UNKNOWN SPECIES OF GIANT DEVIL RAY, *MANTA* SP.

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ABSTRACT: This paper discusses the possibility of an unknown species of giant devil ray, *Manta* sp., distinguished by a dorsal color pattern of symmetrical V-shaped areas of brilliant white bands, a non-falcate rhomboid body configuration, and a relatively short tail. Other undescribed giant mantas and giant fresh-water rays are also discussed.

INTRODUCTION

On April 27, 1923, the American naturalist and explorer William Beebe, aboard his expedition vessel *Noma,* which was approaching Tower Island (also called Genovesa) in the Galapagos Archipelago, observed a large devil ray or manta, of which he immediately made a careful sketch. He later gave the following description:

> A few minutes after six, standing forward close to the starboard rail, several of us saw a very large ray or devil-fish struck a glancing blow by the yacht, and go rushing off along the surface. Realizing what a splendid chance this was for definite observation, I concentrated on the colour and pattern, and when it vanished, I sketched it at once, the details being verified by my companions.
>
> From tip to tip of wings it was at least ten feet, of somewhat the usual manta or devil-fish shape, except that the wings were not noticeably concave behind, and the lateral angles were not acute. The cephalic horn-like structures were conspicuous and more straight than incurved. In general the back was dark brown, faintly mottled, while the most conspicuous character was a pair of broad, pure white bands extending halfway down the back from each side of the head. The wing tips also shaded abruptly into pure white (Beebe 1924: 312).

PHOTOGRAPHIC EVIDENCE

There have been, so far, no attempts at determining the taxonomic status of this fish, which Beebe himself called an "unknown species" (Fig. 1). In the course of a recent study of manta photographs, another specimen from New Caledonia was found to show the same symmetrical white dorsal bands, particularly when the original color photograph (in Fourmanoir and Laboute 1976) was subjected to the process of black-and-white photocopying (Fig. 2). Another photograph (by P. Kopp, in Wheeler 1977) shows an obviously distinctly bordered white band on the right shoulder (the left shoulder is not visible) of a supposed giant devil ray (*Manta birostris*); this may be yet another specimen belonging to the unknown taxon.

An affirmation came when, on December 28, 1989, a documentary film

FIG. 1.—William Beebe's sketch of an unknown devil ray or manta. Probably male. From Beebe (1924).

was shown on German television (3rd Program, NDR [North German Television], N3) titled *Sharks: Hunters of the Seas,* narrated by Heinz Sielmann, and filmed and produced by Sigurd Tesche, of S. Tesche Productions. There is a sequence of more than 30 seconds showing a large manta at close quarters in the waters off Cabo San Lucas, at the southern tip of Mexico's Baja California. The fish showed magnificent, brilliantly-white symmetrical V-shaped bands on its dorsal surface.

The producer, Sigurd Tesche, promised me still photos of the fish, and he also agreed to go through the material not used in the film (personal communications, February, 1990). Several attempts at obtaining this material have proved so far unsuccessful. Consequently, until this material is made available, photographs taken off a television screen will have to suffice (Figs. 3–5).

An unknown species of devil ray may be involved. However, neither Beebe's sketch nor the photographs justify a formal description of a new species at this time; the sketch would seem to be generalized, and the photographs are not helpful in assessing morphometric details due to the perspectives and angles of the fish in motion. Therefore, in order to create an

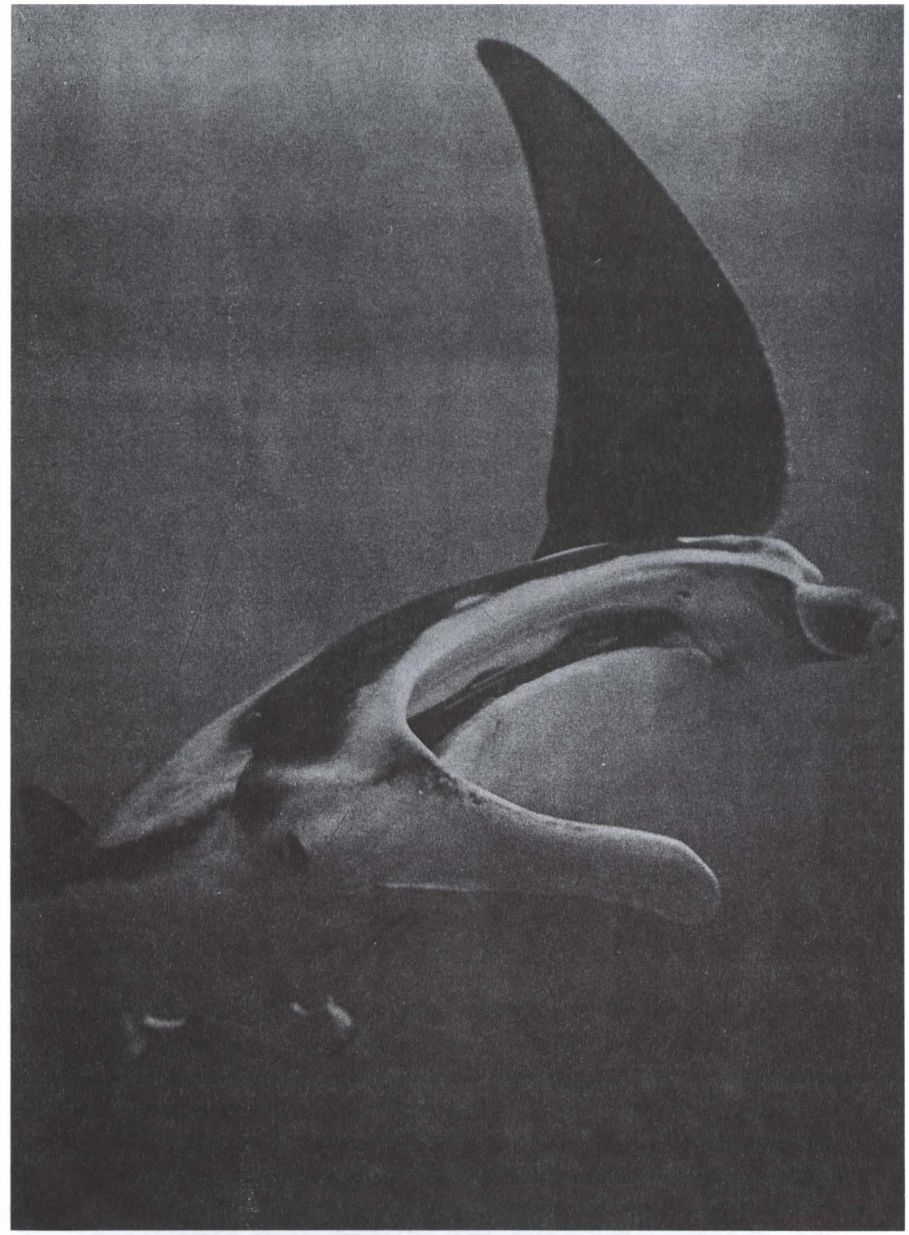

FIG. 2.—Unknown devil ray or manta from Ouvea, New Caledonia. Probably female. From Fourmanoir and Laboute (1976).

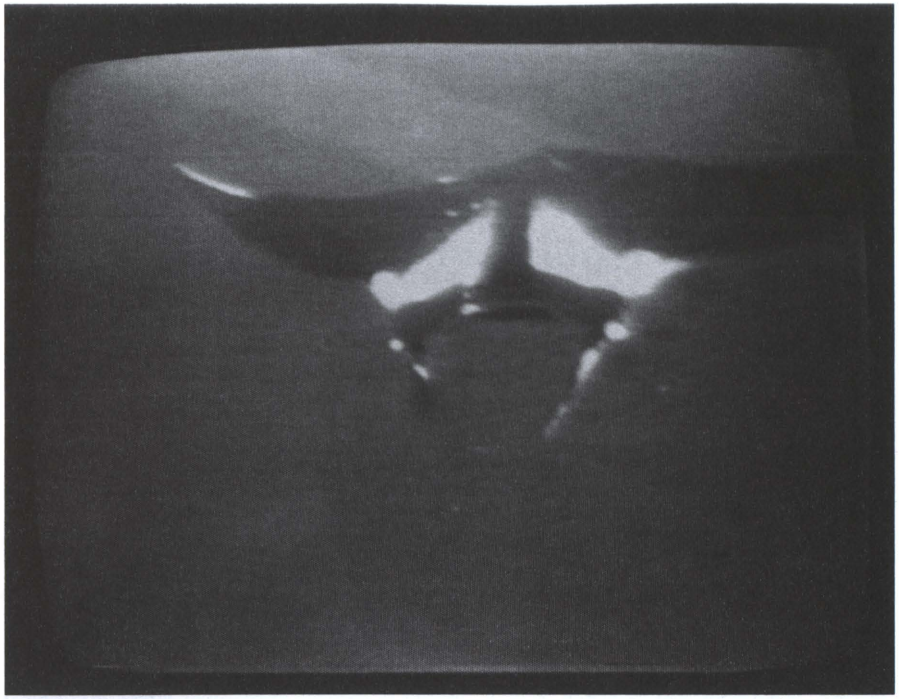

FIG. 3.—Unknown devil ray or manta filmed off the coast of Baja California by Sigurd Tesche, broadcast in December, 1989. This illustration is a "quotation" according to German Copyright Law (§ 51 i.V.m. §§ 94 IV, 95 UrhG).

awareness of this potential new species, and initiate the search for further evidence, it seems more appropriate to present the case on the basis of the available material.

PRESENT TAXONOMIC SITUATION

A giant ray as depicted by Beebe and appearing in the photographs should be classified as either an eagle ray (Family Myliobatidae) or a devil ray or manta (Family Mobulidae). The taxonomic structure of the latter family is uncertain and still debated. There are thought to be either two or four genera comprising a still unknown number of species (Klausewitz 1970), or two genera and 10 species (Nelson 1976), or "several species" (Smith and Heemstra 1988), or they are "all poorly known" (Eschmeyer, Herald, and Hammann 1983). According to the minimum consensus discernible, the Mobulidae contain two genera with nine species: genus *Mobula* Rafinesque, 1810, with seven valid species recognized, and genus *Manta* Bancroft, 1829, with two valid species. Whereas *Mobula* has the mouth on the lower surface of the head (ventrally), and a tail twice as long as the body, *Manta* has a terminal

FIG. 4.—Unknown devil ray or manta filmed off the coast of Baja California by Sigurd Tesche, broadcast in December, 1989. This illustration is a "quotation" according to German Copyright Law (§ 51 i.V.m. §§ 94 IV, 95 UrhG).

mouth extending anteriorly across the front of the head, and a tail conspicuously shorter.

The fish depicted by Beebe and appearing in the photos has a broad terminal mouth and, on Beebe's sketch, a relatively short tail. The line between the lobes on each side of the head is not concave as in mobulas. It is therefore more appropriate to assign the fish to the genus *Manta,* particularly as Beebe himself described a "manta or devil-fish shape" (Beebe 1924: 312). Beebe's manta, as it may tentatively be called, differs considerably from the well-known species *Manta birostris,* the giant devil ray. These differences justify a discussion, and the question of whether or not a new species or subspecies is involved.

DISCUSSION

The material presented here concerns a devil ray or manta of large size, Beebe's sketch depicting an individual of at least 10 feet (3 m) across the

FIG. 5.—Unknown devil ray or manta filmed off the coast of Baja California by Sigurd Tesche, broadcast in December, 1989. This illustration is a "quotation" according to German Copyright Law (§ 51 i.V.m. §§ 94 IV, 95 UrhG).

pectoral fins ("wings") from tip to tip. The fish differs from the recognized species of the genus *Manta* in having a dorsal color pattern of symmetrical V-shaped areas of brilliant white bands, a seemingly rather "square" diamond-shaped (rhomboid) non-falcate silhouette or body configuration, and a tail considerably shorter than in the known manta species.

Color Pattern: The most obvious character of Beebe's manta is its unique dorsal color pattern. The dorsal color is dark brown, with barely discernible dots, "faintly mottled" (Beebe 1924). On the "shoulders" there are two distinctly-bordered, separated but symmetrical areas of brilliant white blotches or bands. Although the dark pigmentation of the well-known giant devil ray (*Manta birostris*) is easily rubbed off—so that the superficial areas of coloration may be natural in some individuals and accidental in others (Migdalski and Fichter 1976)—this cannot have happened to Beebe's individual, or to those of New Caledonia and Baja California. The white areas are distinct on Beebe's sketch, as well as on the photographs, the otherwise dull dorsal color shading "abruptly into white" (Beebe 1924). They are clearly bordered, and absolutely symmetrical. Rubbed-off pigmentation cannot produce brilliant white areas (no such case is on record), but rather *some* irregularly-spaced *lighter* patches.

The photographs show a distinctly-bordered, symmetrical design (slightly different from Beebe's sketch, as the bands seem to curve toward the vertebral mid-line). The individual from New Caledonia (Fig. 2) has white interior and exterior sides of its cephalic fins ("horns"); in Beebe's specimen (Fig. 1), only the interior areas are white. This may be due to sexual dimorphism. The broad hind edge of Beebe's illustration may indicate the presence of genital claspers, so that the individual would have been a male; thus, the individual from Ouvea would have been a female. The white edges of the rounded wing tips on Beebe's sketch, which the Caledonian and Baja Californian individuals do not show, may have been an illusion due to the manta's mode of swimming by curling up the wing tips dorsally and inward, so that the white ventral surface shows, and the falcate tips appear to be absent.

Herre (1936), after having observed *Manta birostris,* stated: "They have a habit of swimming a few feet below the surface with upturned triangular tip of each gigantic wing-like pectoral fin projecting above the water." Also, Migdalski and Fichter (1976) mentioned "the visible parts of the curled-up tips of the huge wings." Therefore, falcate wing tips should be restored to Beebe's illustration, his white "wing tips" providing evidence that the ventral surface is white.

There are numerous explanations for unusual color patterns in fishes that do not necessarily relate to taxonomic differences. Specifically, unusual markings can be color variations that may not even have subspecific status, but may be of a so-called "forma" (e.g., both black and spotted individuals are "forms" of the single species of leopard as they occur in one litter). Color variations of a lesser nature do occur in this group of fishes, but extreme variants as shown by the material presented here are unknown. Nevertheless, color pattern alone cannot constitute decisive evidence for a distinct taxonomic status.

Body Configuration: The body configuration as given by Beebe shows a more regularly diamond-shaped silhouette than in *Manta birostris.* Anterior edges of the pectoral fins are not strictly convex, and posterior edges not strictly concave, as in *M. birostris.* Even with wing tips restored to Beebe's drawing, and the more "elegant" photographs taken for guidance, the wingspan of Beebe's manta is approximately one and a half times the body length, whereas in *M. birostris* it is twice the body length. However, no morphometric details can be gathered from the photographs because of perspective and angle of the fish in motion. There is no way of processing the photographs in order to obtain morphometric data. Therefore, the body configuration cannot be restored with the necessary degree of authenticity to warrant a conclusion.

Tail Length: The tail as drawn by Beebe is shorter than the body length (ratio 0.6:1); it is not serrated. A large dorsal fin is present at the base of the tail. In Tesche's film, tail length seemed to be half the body length. In *M. birostris,* tail length is equal to body length (Makuda *et al.* 1984).

Further Possible Evidence: Fowler (1927) described, as belonging to *M. birostris,* the fragments of a small specimen of devil ray harpooned off the shore reef at Fanning Island in 1924. They were supplied to him with sketches, notes, and details by Stanley C. Ball, a medical doctor. Fowler described the fish as follows: "Disk nearly twice as wide as long [not verified by Fowler's own illustration]; tail broken terminally so now less than disk length. Pectorals rather narrowly triangular, front edge slightly convex, hind edge concave . . . Back blue-black, with two v-shaped bands, angles forming at vertebral line and pointed backward . . . The distance from tip of snout to caudal base given as 112 cm on Ball's sketch, also width of disk same [contrary to his own text above] . . . The specimen noted by Ball differs from any I can find in its coloration, possibly a condition of youth" (Fowler 1927).

The peculiar disk dimensions (printer's error rectified), as well as the unique color pattern (Fig. 6), which is not that of a young *M. birostris* (they are unbanded), hint at another specimen wrongly assigned to *M. birostris.* The double v-shaped band and its "ashy" color may be a condition of youth in Beebe's manta. Or, Ball's specimen may constitute yet another unknown manta species. It was, in fact, subsequently described as a new species, and named in honor of Fowler: *Manta fowleri* Whitley, 1934. Since then, Fanning Atoll has been famous for the numerous research dives for mantas that have been made there. But no further specimen has been found. Though Fowler is known to have made errors in his drawings of fish color patterns (a printing[?] error has been pointed out above), it is not at all likely that, in this particular case, with a naturalist and medical doctor for witness, Fowler confused two dorsal bands with one. It is more probable that he exercised extreme care in drawing the specimen.

Future Research

Further fieldwork is necessary to obtain additional evidence—preferably a specimen—which might then lead to a formal taxon description and naming, if indeed a new species or subspecies is involved.

In the past, dozens of *Manta* species have been described under various names. Today, many of them are considered synonyms of a single species (Smith and Heemstra 1988); others remain apocryphal. As they were described from single specimens, almost always badly damaged and fragmented by the process of being washed up by the sea, these are in serious need of re-identification and revision. An unknown number of species awaits discovery. On mantas, Whitley (1936: 11) stated: "There are other species,

Fig. 6.—Mysterious specimen from Fanning Island, as illustrated by Fowler (1927).

some yet unnamed scientifically, in the Red Sea, off the coasts of Africa, India, the East Indies, South America, and the South Sea Islands. Some of these exceed twenty-four feet in width."

Not even the earliest known engraving of an East Indies devil ray (Nieuhof 1682: Fig. 7) has been identified. Seven pairs of zebu oxen had to be employed to drag this monster ashore. The flesh was said to taste like venison. Although the lobe-like appendages are evidence that the fish belongs with the mantas of the family Mobulidae, there is no known member with seven spines on the tail (Fig. 7). This giant species has never been reported again.

There are, however, continuous reports on giant fresh-water rays from the Mekong River (Thailand and Laos). A giant stingray is reported to be caught in pools and puddles (when the river system dries up annually), and sold in local markets. In 1983, Bangkok newspapers featured the photograph of a specimen from Nakhon Phanom, Thailand, which had a disk diameter of 7 feet, 10 inches (2.4 m), with the tail another 7 feet, 10 inches (2.4 m), and a weight of 532 lb. (242 kg). The fish is said to reach more than 10 feet (3 m) in diameter. This unknown species probably constitutes a larger congener of the small, recently discovered Mekong stingray *Dasyatis laoensis* Roberts and Karnasuta, 1987.

Of similar dimensions, said to reach 6 feet, 6 inches (2 m) in diameter, is another unknown stingray from the Chao Phraya River, Thailand. A German

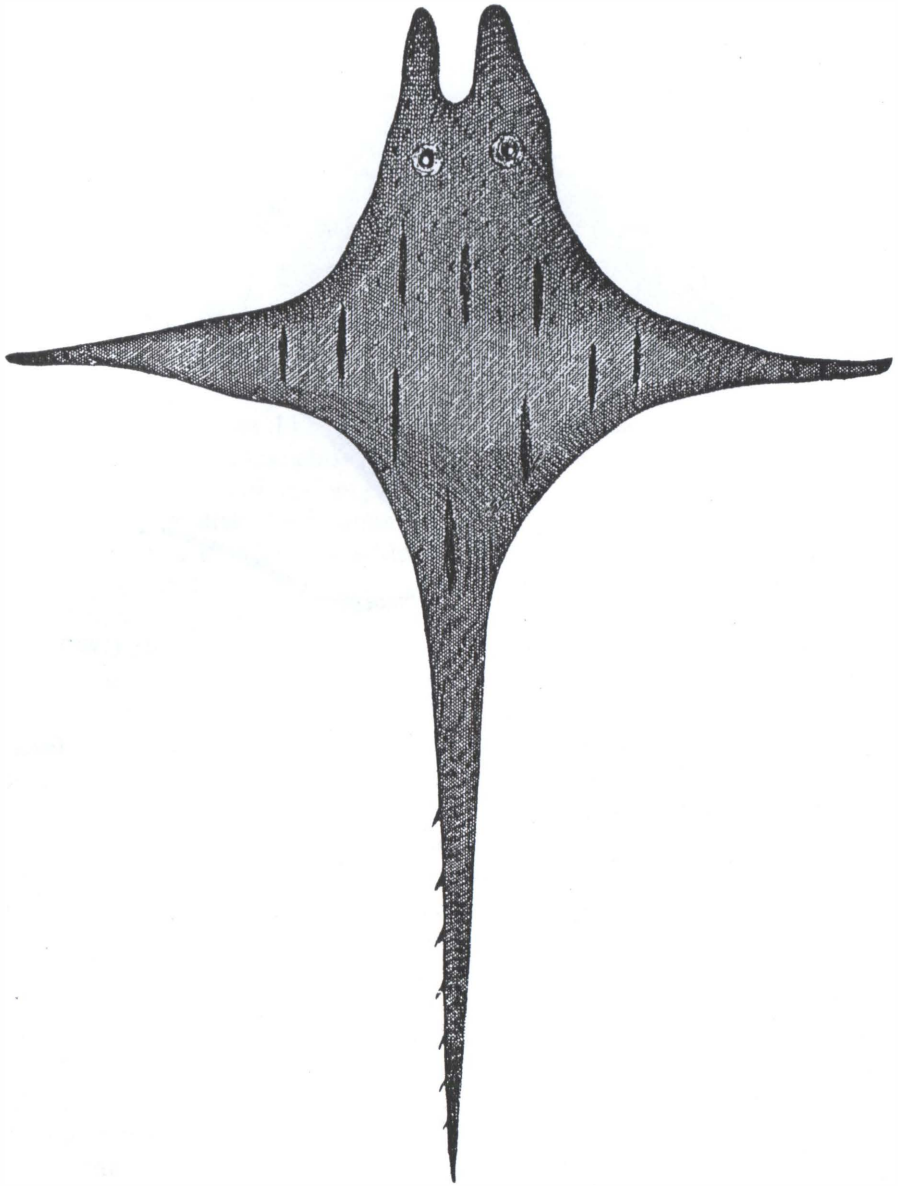

FIG. 7.—Mysterious specimen from the East Indies, as illustrated by Nieuhof (1682).

ichthyologist was recently shown photographs of such giants, as well as a live young specimen of 32 inches (80 cm) in diameter by a Bangkok pet fish exporter (Kottelat 1989). The young ray, as photographed, constitutes a *Himantura* species, but certainly not the well-known *Himantura fluvialis*.

In cryptozoology, collecting reports, sketches, and photographs is just a first step. The ultimate goal of obtaining a specimen, and of describing and naming a new species, would not seem to be too far-fetched in these instances. The flying devils of the deep blue sea, as well as the deadly giants of South East Asia's muddy rivers, offer a truly "gigantic" field for future research.

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